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Research Report

Rising transport costs and urban development: Hamburg - a city of the future

HWWI Policy Paper, No. 1-31

Provided in cooperation with:
Hamburgisches WeltWirtschaftsInstitut (HWWI)

Suggested citation: Ott, Ingrid; Otto, Alkis Henri; Stiller, Silvia (2010) : Rising transport costs and urban development: Hamburg - a city of the future, HWWI Policy Paper, No. 1-31, http://hdl.handle.net/10419/47668

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Rising transport costs and urban development: Hamburg – a city of the future

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HWWI Policy
Paper 1-31
by the
HWWI Research Programme
Hamburg and Regional Development

Hamburg Institute of International Economics (HWWI) | 2010
ISSN 1862-4960

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ISSN 1862-4960

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February 2010
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Foreword to the HWWI studies
Part IV: Hamburg – a city of the future

Demography, regional structure, economic activity – a host of different factors are shaping the development and future viability of German cities and conurbations. In order to be able to shape and support urban development successfully, it is necessary to look at and assess development trends. As one of the largest real estate investors in Hamburg, we must create lasting and stable real estate values. Consequently, the possible development scenarios for a city in the long term – and the future viability of Hamburg in particular – are of major importance for alstria office REIT-AG.

Energy prices and transport costs will be important factors influencing urban development in the future and will therefore have an effect on choice of location, investing activity and the building quality sought after in real estate.

Together with the Hamburg Institute of International Economics (HWWI) we have initiated a joint research project to examine the effects of rising transport costs on urban development. The analysis covers several different perspectives: starting with a global view, the project will go on to examine in stages the regional and then the local perspective. In addition, the effects of rising energy costs on the size of Hamburg, on the structure of its city centre and on its economic development will be analysed and trends for the city centre will be concluded from this analysis.

The recommended actions for the city of Hamburg derived from the results of this analysis are intended to show possible courses of development and are based on the guiding principle “Farsighted Growth”.

The fourth study in this research project, entitled “Hamburg – a city with a future”, makes clear the importance of groundbreaking political decisions for maintaining the long-term attractiveness of Hamburg for its citizens and for businesses. It focuses on the question of what influence can be exercised by the state to cushion against and to compensate for the negative effects of rising energy costs. Different hypotheses are set out and examined in the course of the study, and concrete recommendations for action presented at the end. As an example, the study stresses the importance of expanding public transport options.

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Rising transport costs and urban development: Hamburg – a city of the future

1 Introduction

Future development of cities depends upon a wide variety of determinants, among them both location specific peculiarities like first-nature geography, local labor markets, the institutional framework or the prevailing production structure and macroeconomic trends like demographic and structural change. Models of the so-called New Economic Geography as well as approaches derived from urban economics highlight the impact of transport costs for the regional distribution of economic activity at a world-wide, national, regional, and a local level. Consequently, the level of transportation costs affects urban development. Given a scenario of rising energy costs, transportation costs will increase accordingly and thus affect both the development paths of cities as well as their future structure.

In order to derive a broadbrush picture of the effects of rising transport costs on the prospective urban development of the city of Hamburg, the Hamburg Institute of International Economics (HWWI) has set up a joint research project together with alstria First German REIT. The goal was to determine the basic mechanisms at work in the context of rising transportation costs along several levels of aggregation and based on this to derive clear-cut policy recommendations for a sustainable city development of the growing metropolis of Hamburg. To do so, the analyses included several perspectives each of them leading to a separate report: In the first study, the analysis takes a global perspective thereby determining basic agglomeration and dispersion forces at work as well as their interaction. Study 2 focused at a metropolitan scale and correspondingly on regional effects. Picking up the arguments derived before, study 3 discusses the effects of rising transportation costs on inner-city trends of Hamburg.[1] The present HWWI Policy Paper briefly summarizes the central results of the afore mentioned studies and derives policy recommendations with a clear focus on Hamburg. In the next section we provide a summary of the basic arguments relevant in the presented context. Section 3 determines important policy fields and provides a detailed analysis for each field with respect to the metropolis of Hamburg. Section 4 briefly concludes.

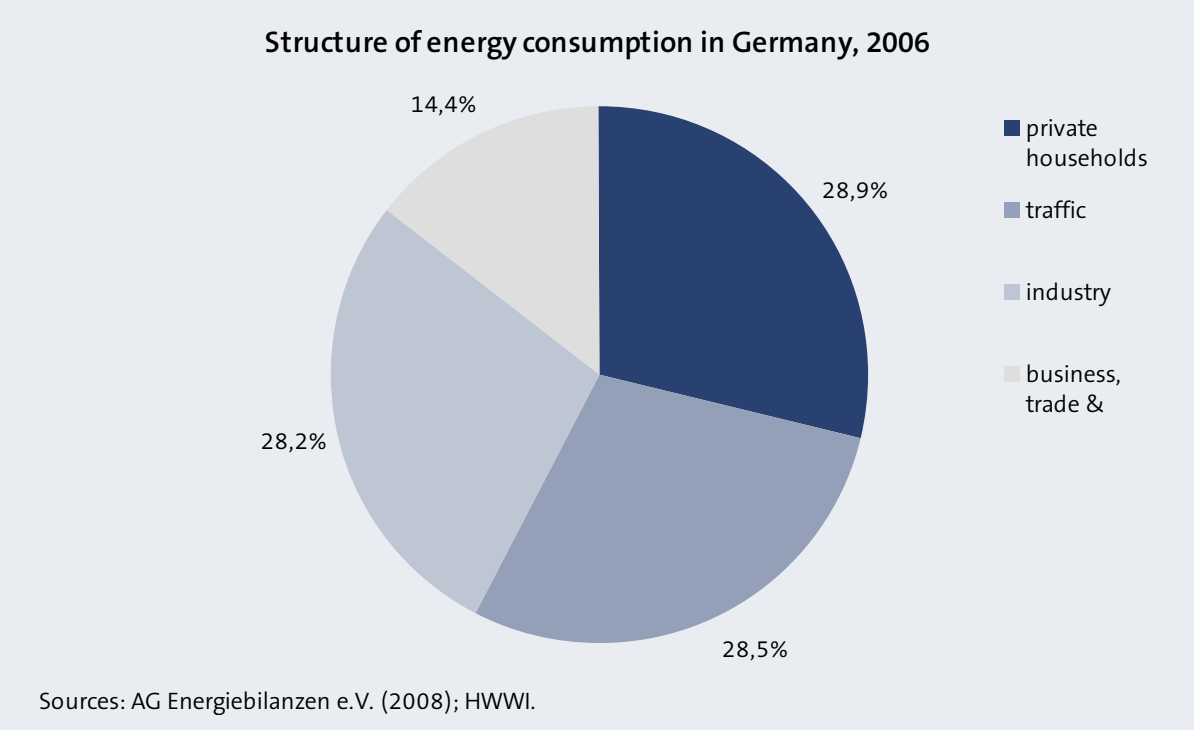
[1] See Boje et al. (2010) for study 1, Ott et al. (2009) for study 2 and Otto (2010) for study 3.

2 Importance of transportation costs for Hamburg's future development

Starting point of these analyses is the forecast of the HWWI that the prices of energy raw material – in particular for crude oil – will substantially increase during the coming years and decades (cf. Bräuninger et al. 2005). Besides, we stick to the assumption that technological progress in the fields of transport and logistic will not compensate the impact of rising energy costs. The transport sector is one of the main energy consumers (cf. figure 1) with a strong dependence on the development of the oil price. Both worldwide and on the regional level, this will have significant effects on the geographical distribution of economic activities and thereby also affecting urban development as the outcome of the location decision of firms and the settlement behavior of private individuals.

Shifts in the costs of transportation affect the interplay between agglomeration and dispersion forces, the international division of labor and thus will influence inter-regional, intra-regional and international trade flows. As a harbor, the metropolis is strongly linked to international markets and therefore is strongly embedded into the process of globalization. Besides, numerous economic activities are related to the logistics' sector. As a consequence, the economic structure of the metropolis depends to a large extent on the level of transportation costs. For the aforementioned reasons, the price of transportation is an important determinant for the economic structure of Hamburg. It is therefore natural to analyze whether Hamburg will go on growing and hence strengthen agglomeration or whether enterprises and population will spread in the surrounding areas.

Figure 1:



Sources: AG Energiebilanzen e.V. (2008); HWWI.

Basically, rising transportation costs act as dispersion force since it makes transport of goods and people more expensive. There are several arguments that support the view that rising transportation costs raise the attraction of Hamburg as a location for enterprises on the basis of market potential effects and end up in higher concentration of economic activity. As argued before, the metropolitan region of Hamburg is excellently connected to the world markets due to its harbor. As a consequence, the city might attract export-oriented industrial branches if energy costs increase. This opens up several opportunities to strengthen and even enhance its already significant industrial activities as well as to develop them further. The threat of future dispersion forces through rising energy costs, however, is compensated by Hamburg's costs advantages in the logistical sector. Hamburg, as a global logistical hub and its local specialisation in the transport and logistic sector, will counter the tendency of a relative strengthening of dispersion forces due to its advantage in international transportation costs and access to foreign markets.

Concerning Hamburg's perspectives as an industrial site, the ongoing structural change towards research-intensive and knowledge-intensive industries is of high relevance. In Hamburg nearly two thirds of all industrial workers are already occupied in knowledge-intensive industries, above all in the aircraft construction and engineering. The number of employees in the knowledge-intensive industries has continuously risen since 1999 and Hamburg's specialisation in these economic branches is already higher than in other German

federal states (cf. Kovalevsky/Stiller 2009). Hence, in these industries a solid base for future economic growth has already developed in the city of Hamburg.

Simultaneously Hamburg experienced a distinctive structural change towards the service sector during the last decades which is typical for growing cities. In the six biggest German cities (Berlin, Hamburg, Cologne, Munich, Frankfurt and Stuttgart) more than half of all employees already work in knowledge-intensive services and industries (cf. Statistisches Bundesamt 2010). Altogether, for knowledge-intensive service branches, including research and development activity, transportation infrastructure is less important than for "traditional" industries. Rather modern information technology and telecommunication networks are crucial.

For technology-based branches as well as for creative and innovative businesses it can be expected that the agglomeration forces will dominate the dispersion forces resulting from rising transportation costs. This assessment goes back to the fact that firms of the knowledge-economy tend to agglomerate due to significant positive impacts of face-to-face-contacts on productivity. Technology- and creativity-based industrial clusters evolve for sharing knowledge. For these sectors we can assume that transport costs will play a minor part in their cost structure.

Economic perspectives of Hamburg depend to a large extent on population size. In the economic literature several arguments can be found suggesting that city centres will become more attractive as residential places while transportation costs rise. This tendency will be reinforced if Hamburg will exploit growth potential of existing specialisation and location advantages. However, actual population forecasts assume that the number of inhabitants in the hanseatic city might decline significantly after 2025. From an economic perspective one might doubt whether this is realistic. As the centre of a metropolitan region with more than 4 million people and more than 300.000 incoming commuters, Hamburg might gain in importance as a place of residence in the long-run due to rising energy and commuting costs.

In addition, we expect that older citizens keep on moving into the city due to rising problems in the medical, nursing or public care sector in rural areas. This trend will also contribute to residential demand in the city. However, population ageing will also be on the agenda without such an inflow of older people. This goes back to rising life expectancy and a declining number of births. If age-specific settlement patterns and behaviour of different income groups remain stable, residential demand in districts close to the city centre will increase even further. These districts are already populated quite strongly today exhibiting a high share of one- and two-person-households of the age group between 30 and 65 years.

Finally, the effects of future infrastructure investments for the attractiveness of Hamburg and the metropolitan region have to be considered. Improvements in intraregional, interregional and national infrastructure will raise the local attraction of Hamburg. This is important for the Hamburg's economic perspectives which highly depend on the incoming of people – as commuters or new inhabitants. Commuting and inner-city mobility are crucial for economic success and exploiting growth potentials. Against this background, infrastructure projects improving the accessibility of the metropolitan region and inner-city connections supply concentration forces. This is due to the fact that the mobility of human capital is a basic condition for keeping agglomeration advantages in Hamburg working. These agglomeration advantages appear in numerous parts of Hamburg, in which economic activity is densely concentrated and growing. These structures offer potentials for sustainable, local economic growth.

3 Central political fields

To sum up, there are foreseeable economic and demographic trends for Hamburg which can be potentially positively influenced by policy measures. At the same time new challenges for urban policies arise from future trends, e.g. rising energy costs. Against this background the question comes up, how much mobility a modern city needs. Will it be advisable and realisable to combine living and working in the same area more than up to now thereby reducing traffic and transportation cost? This is a highly relevant issue when discussing polycentric versus monocentric development strategies. As to now, Hamburg can be considered as a rather polycentric city. Furthermore, to keep this structure is a pronounced objective of urban development policy in Hamburg.

Generally, reducing transportation costs – released by rising energy costs – should be on the top of the agenda of policy makers for keeping a location competitive. Such a strategy can be based on new technologies and innovative traffic concepts as well as on new styles of urban planning. This could, for instance, be realised by considering transportation costs while planning business areas and industrial districts. Altogether, the results of our analysis imply that future policy approaches for Hamburg should place emphasis on the following policy fields:

- Industry, services and advantages of localization
- Knowledge carriers and mobility
- New concepts for living: integration of living and working places
- Harbour and logistics

"Industry, services and advantages of localization"

Rising transportation costs affect the existing economic structures via various channels thereby also impacting on sectoral and functional specialization.[2] It is obvious that both the extent of economies of localization and the role of transportation costs strongly differ between industries and service branches due to specific location requirements. A high location quotient is an indication for the emergence of localization externalities or for location advantages due to first-nature geography advantages.[3] This applies clearly to Hamburg's specialization in port and transportation services. Specialization advantages positively affect the choice of location and tend to support agglomeration potentials in favour of Hamburg. Hence, strengthening the advantages of localization is an option for countervailing the dispersion effects caused by rising transportation costs.

Considering Hamburg's specialization patterns and the interdependencies between the secondary and tertiary sector, the situation of Hamburg is quite promising. In several sectors industrial enterprises find considerable specialization advantages. Examples are the harbour industry and logistics as well as the aerospace industry. In these cases there are also strong complementarities between secondary and tertiary sectors. Additionally there are pronounced specialization advantages in most branches of the service sector. A closer look reveals that the

[2] Functional specialization describes regional separation of production and management activities of multi-unit firms (see Duranton and Puga (2005))

[3] The location quotient is the quotient of the share of employees in a branch in the total number of employees in Hamburg and the appropriate share in Germany. A value greater than 1 suggests a relative locational advantage of Hamburg in the specific branch. A location quotient between 0 and 1 indicates that this branch is underrepresented in Hamburg in comparison to the national average. Location quotients for different sectors in Hamburg are presented in Boje et al. (2010).

associated fields and branches are quite differently affected by transportation costs. At the same time there are no first-nature geography advantages which closely tie these activities to the city of Hamburg.

For example, first-nature geography does not matter for financial services, real estate and business activities. Within these branches the existing specializations are clearly driven by localization externalities. For the corresponding firms face-to-face contacts are more relevant for the choice of location than transportation costs. Therefore, rising transportation costs are more relevant with respect to transportation of people than goods. Hence, travel time is an important factor guiding choice of location. Hamburg might compensate the spreading tendencies arising through higher physical transport costs by a reduction of time costs. In Hamburg this argument mostly applies to “activities of head offices; management and consulting activities” while e.g. other related activities in the context of functional specialization such as “legal and accounting activities” or “office administrative, office support and other business support activities” are expected to be less affected by changing transportation costs.

In particular, the reduction of time costs can be obtained by an expansion and a qualitative improvement of the infrastructure. Especially the travel time to the airport is an important aspect for the settlement of head offices. At the same time spatial concentration of economic activities could reduce time costs within Hamburg. The spatial concentration of economic sectors is particularly important against the background of increasing formation of clusters of skill-intensive industries. There is a tendency that new firms prefer to settle in a location where they find already existing corporate networks, highly-skilled employees and research institutes of the specific branch.

In general different measures and initiatives can support specialisation advantages of specific branches in Hamburg. Agglomeration advantages result for example from a locally available pool of highly-skilled labor as well as of branch specific service providers. The technological efficiency heavily depends on a close collaboration of the regional actors in the innovation process, which supports the positive effects of spatial proximity and therefore the agglomeration advantages for firms in Hamburg. The expansion of the public infrastructure in branches, in which Hamburg is specialized, as well as improvements in quality of the existing public R&D facilities and strategies to improve the efficiency of the public research infrastructure can contribute to that.

Operational Field „Knowledge Carriers and Mobility"

Interregional and international migration

In the course of the structural change towards a knowledge society, the demand of firms in Hamburg for highly skilled workers in the service sector as well as in knowledge-intensive industries will increase. Since other cities in Germany and worldwide face the same challenges the competition for these "knowledge carriers" between cities is continuously rising. Highly qualified workers are particularly mobile, and they tend to choose jobs in cities which offer a high living standard and attractive neighbourhoods (Leßmann et al. 2002).

In Germany, Hamburg was the second important destination for foreign immigrants after Berlin since 1998. However, with regard to future labour demand it has to be negatively evaluated that the share of foreigners with secondary or tertiary education only amounts to 35.3 % in Hamburg which is the second lowest share in the six largest German cities. In Stuttgart, for example, more than 46 % of foreigners have reached this educational level (cf. Statistisches Bundesamt 2008). This implies that there is potential and need for Hamburg to further profit from the international "brain gain" (Damelang et al. 2008).

In the course of the last years, several initiatives have been launched to position Hamburg more clearly as a destination for immigrants. The Chamber of Commerce and the "Behörde für Wirtschaft und Arbeit" founded Hamburg Marketing GmbH in 2004 in order to raise Hamburg's degree of popularity internationally. In 2007, the "Welcome Center Hamburg" opened its doors. Its task is to assist new Hamburg inhabitants. Corresponding services concern for example registering their new residence in Hamburg and extending the visa (cf. Welcome Center 2010). This initiative is positive as contributing to overcome bureaucratic constraints for immigrants.

Generally, when designing instruments that should help to increase the immigration to Hamburg, it has to be taken into account that highly skilled workers often have a highly skilled spouse and children. The probability that a skilled person stays in Hamburg in the long run are comparatively small if the spouse does not find an adequate job. Also important is the supply of high quality childcare places as well as educational opportunities in schools and universities which consider the internationality of the immigrants. To allow for these aspects, support should be given for universities as well as municipal institutions by establishing a service that is committed to find adequate jobs for the spouses and child care slots for the children. Such a service has become a key strategy of universities in other countries to hold qualified employees.

The continuous population increase of Hamburg in the past, which can be ascribed to a positive balance of migration from other regions in Germany and from abroad, illustrates the

attractiveness as place of work and residence. Nevertheless it is essential to encourage the attractiveness of Hamburg, for example offering attractive living space and cultural opportunities. Richard Florida (2002) points out the importance of openness, internationality and diversity as location factors. Mobile knowledge carriers are increasingly geared to these factors. Here it has to be considered that the internationality of Hamburg is not only the result of its global economic integration. The internationality of Hamburg is also encouraged by cross-border cooperation in numerous fields of society, for example in education and tourism. The basic precondition for an increase in internationality is an efficient supra-regional transport infrastructure. Especially the airport and its international linkages are of particular importance.

Due do demographic changes the national-ethnic diversity of Hamburg's population gains weight as a location factor. The demographic aspect of diversity should increasingly enter urban development policy to encourage the sustainability of Hamburg. Numerous initiatives in this respect point into the right direction and should be encouraged continuously. Appropriate positive examples are the projects of the IBA (Internationale Bauausstellung) in Hamburg, which takes place from 2006 till 2013 with a focus on the urban district Wilhelmsburg. The goal of this urban development project is to promote multicultural urban quarters weighing up political options, for example with respect to the provision of housing space as well as in the field of economic and social policy.

Regarding future requirements for city development, the concept of an "Open City" goes far beyond the aspect of internationality and integration. For example openness can be seen as an attribute in the urban planning process which describes the active participation of different actors in designing urban development concepts (for example via bottom-up strategies in the development of construction projects and urban district planning). In this spirit a city is called open if it allows for possibilities of new urban development concepts, offers space for the development of new branches and supports diversity. The ability to pass organisational and structural changes as well as to support creative milieus is a further characteristic (cf. Studio UC 2010). Numerous forms of these aspects can take place in an integrated urban development concept for Hamburg. Therefore the concept of the Hamburger Senat "Wachsen mit Weitsicht" (Growing with foresight) which sets the course for the future development of Hamburg is appreciated. From the perspective of the present analysis it has also to be considered that increasing transport costs exert influence on the urban development perspectives and the structural change as well as influence the conditions for the future development of Hamburg.

Commuting

Not all people working in Hamburg choice the city as their place of residence. Among others, households decide where to live depending on commuting costs, income, and the household

structure. In Hamburg, more than 300 000 people commuted to this city every day in 2008 (cf. Bundesagentur für Arbeit 2008). In contrast to other German cities, there is positive commuting trend. Against the background of our analysis it can be expected that due to knowledge-based structural change a rising number of highly skilled people will be attracted by attractive jobs in Hamburg during the next decades. This will most likely result in a higher number of people that commute to Hamburg, especially to the city centre, and in increasing traffic. On the other hand, rising transportation costs affect concentration and dispersion forces, as they increase commuting costs. If attractive living space in the city rises, the probability of commuters moving close to the workplace increases. This would result in a higher number of inhabitants. Alternatively the increase in transportation costs could affect the people's choice of mode of transport. Although Hamburg has already an effective public transport system, individual transport (automobiles) has been dominating so far.

There are plenty of options to counter growing traffic flows. Hamburg has improved its public transport systems in the last years. A better accessibility and a competitive cost structure have lead to a rising of number of people using public transport. The city's plans to expand the public transport and raise the frequency of trains and busses have been successful. Hamburg is planning a new city train (Stadtbahn) which can further improve the accessibility of the city's centre as well as contribute to ecological city development. Altogether, 50 km track sections and about 85 stops are planned. The first part of the Stadtbahn will be build until 2014 (cf. HVV 2010). Incentives for eco-friendly traffic go hand in hand with Hamburg being "European Green Capital" of the year 2011. To sum up, Hamburg is on good way coping with rising public transport.

But Hamburg is not only planning to improve the capacity of its transport system, but also the efficiency in ecological and energy matters. Hamburg has installed new drive systems for busses, taxis and fairies contributing to ecological sustainability and reduction of negative traffic externalities. As good practices from other cities exhibit, speed limits, city tolls, taxes on pollutive cars and the implementation of ecological zones could further help to reduce traffic and support public transport (cf. Collani et al. 2009). There is a wide range of political and social solutions and Hamburg should cooperate with other successful cities in order to benefit from spill-over effects. But it has to be kept in mind that a quicker transportation from the environs to the city is not an instrument that can be used to getting more people to move to Hamburg. It rather facilitates commuting from the outskirts.

Operational Field "new concepts for living: integration of living and working places"

Given the 11th population projection for Hamburg the number of residents is expected to increase until 2025 by roughly 3 % and to decrease afterwards (until 2050) by round about 8 %. If this projection turns out to be true the decline in population size poses the question whether Hamburg actually needs more housing and office supply in the long run and whether city development programs that focus on the expansion of urban land use, for example the "leap over the Elbe", are really forward-looking policies.

While the projected population development is far from being certain the aging of Hamburg's society seems to be inevitable. If the current location and housing patterns of different age groups remain stable in the next decades this will probably lead to quite different economic developments across Hamburg's districts. Since residents in the age of 30 to 65 tend to settle in districts close to the city centre a significantly higher share of residents between 50 and 65 years will lead to a higher demand for inner city, small size dwellings in future years and, very likely, to increasing rents or housing prices in those parts of Hamburg. At the same time the expected declining number of children or families could possibly lead to falling land and housing prices in Hamburg's districts close to the urban fringe. Therefore, policy makers and public authorities might development strategies how to mitigate problems and issues of diverging developments across districts.

However, the population projection described above might also turn out to be wrong, mainly because migration patterns change over time and, therefore, are hard to predict. There are several economic arguments or reasons to challenge the projections described above. For instance, falling inner city land and housing prices caused by initially shrinking population figures may allow families who in the past decades used to locate in the urban fringe to find affordable houses and apartments in Hamburg. Furthermore, the aging and shrinking population in Germany's peripheral regions is expected to be confronted with shortages in medical supply and the provision of public. This might give residents a strong incentive to move to cities where a higher population density or market size ensures the provision of those goods and services. Apart from that, current models of urban land use predict that higher energy prices, which tend to increase commuting costs, will motivate employees to settle closer to their working places. Today more than 300.000 employees living outside of Hamburg commute to Hamburg. Hence, one should also consider a scenario where cities and particularly Hamburg grow in population while at the same time rural areas lose residents.

If Hamburg's population continues growing in the next decades this will certainly increase the need for new inner city residential zones. In general the low population density of Hamburg and especially in the south of Hamburg indicate that there is ample space for a possible

expansion although one has to take account of the fact that some parts of Hamburg will possibly be affected in the next century by a rising stage of the Elbe as a consequence of global warming. Currently, city expansion focuses on the city centre (HafenCity, IBA 2013). Given the fact that a significant share of business activities is already located in the city centre (for instance City Süd, the harbour, the large shopping and retail zones) the costs for additional infrastructure needed for additional residential zones and business districts are possibly higher as compared to other locations in other boroughs of Hamburg. Therefore, an alternative strategy could be to strengthen the historically based polycentric structure of Hamburg.

Furthermore, global climate change and rising energy cost will increasingly put pressure on policy makers and city planners to rethink current patterns of urban or metropolitan land use and commuting patterns. One way to deal with the challenges of global climate change and rising energy costs is to increase the attractiveness of public transport. In addition to that, the ongoing structural shift of output activities to the service sector and the creation of many new jobs in knowledge or communication and information intensive areas possibly allows city planners to implement a stronger integration of residential and commercial zones. The separation of business districts and residential zones (proposed for instance in the Athens Charter published by LeCorbusier) that shaped urban landscapes for many decades was probably a good policy guidance in the industrial era and helped to protect urban residents from pollution and emissions. However, this strict separation is probably not necessary anymore in a service economy. A positive effect of a closer integration of living and working might be that this would help to reduce commuting and thereby to reduce green house gas emissions and at the same time to use urban space more effective.

Operational Field “the harbour and logistics”

Important concentration forces with positive economic potentials will result from first-nature geography advantages and spatial factors of habour related business activities in the future. On the basis of numerous complementaries between economic activities and the harbour there is not only specialization in the area of the logistics, but also in other branches, as for example in the “wholesale and retail sector”. In addition, the secondary sector particularly “production of other transport accessories“ (ship and aircraft construction) and “Coking plant and mineral oil processing“ depends heavily on the harbour. Besides, the metropolitan area of Hamburg is the most important location of the maritime economy in Germany whose core is the Hamburg harbour.

Given its positive effects on numerous branches of industry, the harbour will also be in the future important for the business development of Hamburg and the metropolitan region. Improvements of the harbour-related infrastructure can contribute to reductions of transport costs and thereby offset the effects of rising energy costs. This would strengthen the agglomeration forces of Hamburg, because the improved accessibility of the harbour raises the market potential of the metropolitan region. In particular the accessibility of international markets will be an important location factor for establishing industrial enterprises in the future.

The port of Hamburg is faced with the challenge to improve its competitiveness steadily, since it is in intensive competition with other European harbours. The overall costs of transport consist of shipping costs and hinterland transport costs. Due to the geographical location of Hamburg more than 100 km to the east of the Elbe estuary as well as the connection to the highly productive German infrastructure network, Hamburg has an advantage against other European harbours, because the fraction of hinterland transport costs is disproportionately large to the overall transport distance. To keep these advantages, however, continuous improvements of the hinterland connections and the accessibility of the harbour for bigger ships are necessary prerequisites in the future.

4 Conclusions

All in all Hamburg will be affected by numerous economic and demographical changes in the nearer future. Due to these foreseeable impacts urban development policy should act forward-looking today. It is also relevant for Hamburg's development perspectives that rising energy costs will influence transport costs. Transport costs are a crucial factor in the interrelationship between dispersion and agglomeration forces in urban areas. They are a vital determinant in the decision making process of choices of location and their importance will increase when energy costs continue to rise, as expected. Rising energy costs will not only influence the decision of firms and people where to locate, they will also influence the urban development of Hamburg and its economical competitiveness. This should be taken into account when future city concepts are developed. One promising approach is an integrated concept of urban development. In the case of Hamburg an urban development projection (Leitbild) is already available. To profit from it the objectives agreed on have to be animated more consequently by public authorities.

In general we conclude that Hamburg could experience a lot of advantages if costs of energy and transportation will rise. These advantages can be obtained if economies of scale of the metropolitan region of Hamburg prevail in the future. Thereby it is possible to realise the potentials of the industrial and service sectors. Consequently, the recommendation for the city of Hamburg is to proceed in enhancing the efficiency of its public infrastructure, e.g. by better access to the airport or the railway network to reduce the firms' time costs in those branches where mobility of people is a central cost factor.

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